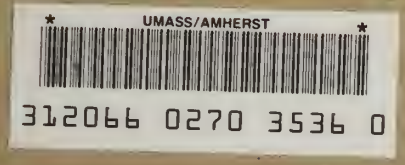

The History of the Quashnet River Valley

Compiled by Donald Keay
for the Waquoit Bay National Estuarine Research Reserve
2000

About the author:

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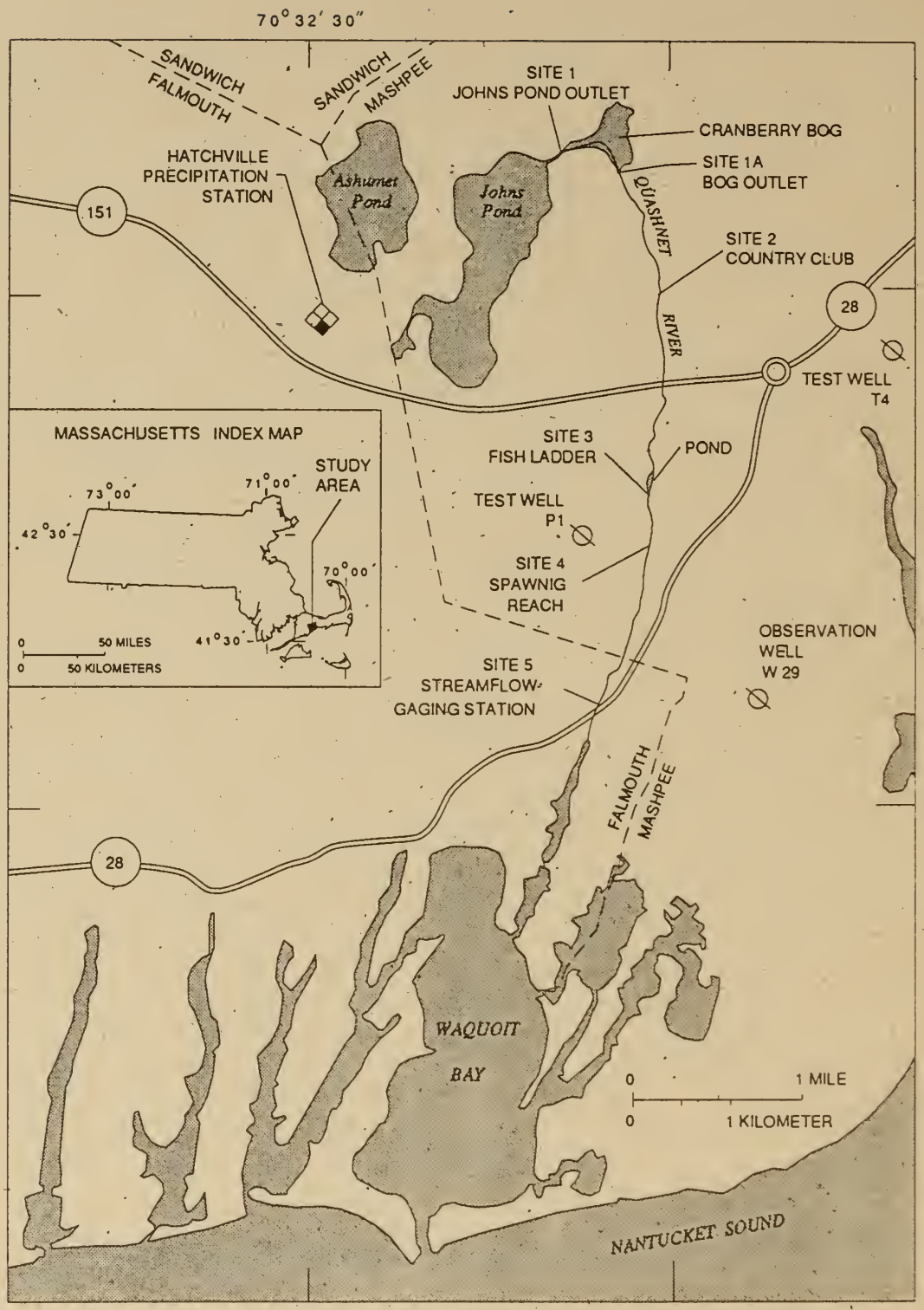
Our thanks to Steven Hurley and Joseph Bergin from the Massachusetts Division of Fisheries and Wildlife for their assistance with this project.


70° 32′ 30″
SANDWICH
FALMOUTH
SANDWICH
MASHPEE
SITE 1
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CRANBERRY BOG
SITE 1A
BOG OUTLET
HATCHVILLE
PRECIPITATION
STATION
Ashumet
Pond
Johns
Pond
QUASHNET
RIVER
SITE 2
COUNTRY CLUB
151
28
41° 37′ 30″
TEST WELL
T4
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STUDY
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73° 00′
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SITE 3
FISH LADDER
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TEST WELL
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WAQUOIT
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Preface

The Quashnet River flows through the towns of Falmouth and Mashpee on the south shore of Cape Cod. Its present-day source is an outlet from Johns Pond in Mashpee where a gate and fish ladder regulate the flow of water (see map on opposite page). A ditch connects the stream with a large swampy area, part of which is the only working cranberry bog in the Quashnet Valley. The river then winds its way through the Quashnet Valley Country Club. It continues to flow south passing through abandoned cranberry bogs returned to natural habitat, and then through a restored area owned by the Massachusetts Division of Fisheries and Wildlife. After the Quashnet crosses the Falmouth town line, it becomes the Moonakis River, most of which is a tidal estuary. From there, the waters flow into Waquoit Bay.

The Quashnet Valley is about five miles in length containing some six hundred acres of watershed. The river is never wider than forty feet nor its depth greater than six. Compared to the great basins of the world, it could be argued that such a small stream is of minor consequence. But it is an important resource to the region. The flow of clear, cool water supports fisheries, especially trout, herring (blueback and alewives), and eels. As the largest supplier of fresh water to Waquoit Bay, the Quashnet River is a vital link in an ecosystem which encompasses fisheries, recreational lands, beaches, and the bay itself.

A study of the Quashnet River Valley provides an excellent example of the impact, both negative and positive, which human activities have on natural resources and the environment.

Human Settlements

The Wampanoag, or "People of the First Light," have inhabited the Waquoit region for close to 8,000 years, according to archaeological record. Organized in small villages and seasonal camps, the Wampanoag fished the waters of the numerous coastal streams, hunted along the banks and in the forests, and planted crops along the shores. The productivity of the river and estuary supported an active trade between these villages and others up and down the Atlantic seaboard.

Europeans settled in the Cape area early in the seventeenth century. Bartholomew Gosnold explored the shores in May, 1602. He named the peninsula Cape Cod because of the abundance of fish in the coastal waters. An area called Suckanesset by the Wampanoags, Gosnold designated Falmouth in honor of his home port in England.

The arrival and settlement of Europeans changed forever the lives and traditions of the Wampanoag. The increasing population of settlers gradually outnumbered the Wampanoag. Smallpox and other diseases, introduced by the Europeans, ravaged the Wampanoags in a 1616 plague and again in 1633 and 1654. In the latter part of the century, King Philip's War caused wide-spread misery and loss of life among the Wampanoag.

As the European settlers arrived, they laid claim to the lands, cleared forests, and established themselves in small agricultural, fishing and hunting villages. As their populations increased, towns evolved in convenient geographic locations. A central meeting house was the focal point serving the religious, social, and political needs of the community.

Local governments were organized and the people and elected officials made up the body politic, which dealt with issues of public concern. Settlement in Falmouth began in 1660 and in 1686 the community was deemed to be sufficiently organized for incorporation.

In 1660 Plimoth Court set aside 10,500 acres for the exclusive use of the Wampanoag, prohibiting the sale of these lands to white settlers. Concerned with the continuing plight of the tribe, Reverend Richard Bourne of Sandwich, in 1674, with the help and support of two sachems (Tookenchosen and Webquish), secured confirmation of Wampanoag possession

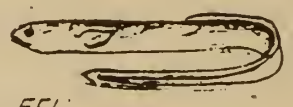
Map of Mashpee from the middle 1700s, reproduced from "Extracts from the Itineraries and other Miscellanies of Ezra Stiles," (Yale University Press).

of the region known as Mashpee including the entire Quashnet Valley from its natural source to Waquoit Bay. Secure in having a place (at least for the time being) some Wampanoag continued their traditional way of life in small villages near water resources. In 1674 Bourne noted the existence of a number of these communities whose names appear in somewhat modified forms on modern maps. Among these were Santuit, Pawpoesit, Coatuit, Mashinope, Wakoquet, Ashimut, Quissets, and Tatekets.

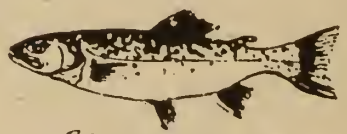
The River as a Habitat

The natural source of the Quashnet River (then known as the Quashnut) is a cedar swamp about an eighth of a mile east of Johns Pond. The River was fed by cold springs in this boggy area and, as it wound its way south, the volume of water was increased by ground water. Along the route, the River flowed through gently rolling hills and forests of pines, cedars, hemlocks, beeches, and other species of trees. Where sunlight was able to penetrate the dense canopy, wild grasses and flowers carpeted the banks.

The Quashnet teemed with fish, most notably the sea-run brook trout called salters. Herring and eels were also common. Conditions were especially suitable for brook trout. The cool temperature of the water (about 65 degrees and rarely reaching 70) was to their liking. Glass shrimp, sand worms, insects, and other small organisms provided an excellent food source. The fine gravel bed was ideal for spawning and bank overhangs sheltered the fry from predators. In May or June mature trout swam up the cool water of the Quashnet River to escape the warm temperatures in the estuary.



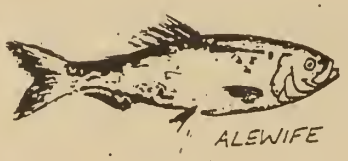
EEL



BROOK TROUT

Drawings by Caroline Goldstein

Spawning took place in the fall. The female brook trout sought out gravel or coarse sand areas of upwelling springs to construct a redd (nest for eggs) by sweeping with their tails. After spawning the female swept gravel back on to the fertilized eggs where they incubated under the protective layer of gravel. Upon hatching in the spring, the fry were about a quarter inch in length. Movement in salter brook trout populations was highly variable with some brook trout remaining in the stream their entire lives, and others entering the salt water areas for varying lengths of time.



ALEWIFE

Alewives also found the Quashnet River to be a suitable habitat. In early spring they migrated up the River to spawn. By fall, the alewife fry were large enough to swim to saltwater and upon maturing returned to the River. The alewife fishery was not as important because their preferred spawning ground was Johns Pond and at that time there was no connecting passage between the pond and the swamp. The nearby Childs River, whose source is the southern end of Johns Pond, was more suitable and provided a better supply of alewife herring.

Drawing by Caroline Goldstein

Early Industries

To meet the needs of the growing population, industries began to flourish in the 1700s. Saw and grist mills were constructed to meet the need for lumber and the grinding of grain. Early in the eighteenth century 8 mills were operating in the eastern section of Waquoit including the Moonakis River. Although most relied on wind power, some utilized water currents. This area of Waquoit was part of the Mashpee land grant; however largely because of the economic value of local industries, the Moonakis River region was incorporated as part of Falmouth on April 5, 1725, establishing the present town line.

Despite the increase in human activity, the river remained a prime fishery. Angling was becoming a sport as well as a means of supplying food. The Quashnet River was well-known as an active trout stream, as Dr. Jerome V. C. Smith noted in the first book on sport fishing to be writen by an American, Natural History of the Fishes of Massachusetts, published in 1833. Smith was enthusiastic about fishing in the Childs and Mashpee Rivers. He pointed out that there was an abundant supply of trout in the Moonakis estuary but that the upper reaches were threatened by the construction of a girst mill in 1832, where present-day Martin Road crosses the stream. There was no fish ladder there and the waters cascaded over a so-called waste-way that was too high for the fish to scale. Thus, Dr. Smith was concerned that the mill could obstruct the spawning grounds of the trout and the herring. He was surprised

Mill house on the River, drawing by Caroline Goldstein

that such construction had been allowed because it could ruin the fishery above the mill. He also reported that fish, which failed to leap up the waste-way, fell back into shallow pools where the mill owner had erected a type of pen from which they could not escape. The mill owner could thus harvest them at his pleasure.

Despite Dr. Smith's concerns, many thought there was a plentiful supply of fish and wealthy sportsmen traveled to Cape Cod from as far away as New York City to fish the streams and hunt the forests. Among these, the most notable were Daniel Webster and Grover Cleveland. In 1843 an article appeared in The Spirit of the Times in which an angler reported:

> The 27th of the month brought our last week to a close, and, ever anxious to explore untrodden ground, we took a look at a river, said to be full of brook trout, known as the Quoshnet (sic.) River. Most of the entire length may be forded but the track is through a tangled thicket and difficult to make rapid headway at every sandy place we could see hundreds of trout, some, apparently of large size darting back and forth and appearing to be as plentiful as herrings. We fished for an hour or two and caught upwards of a hundred of them, just for the sport, and then departed.

The arrival of the railroad in 1870, providing service from Boston to Woods Hole, brought an influx of tourists attracted by the natural beauty of the Cape. Vacationers built homes and began spending summers near the shores. They took advantage of the local natural resources, actively participating in fishing, hunting, and boating.

In 1850, Mashpee residents voted to dig a channel linking Johns Pond to the source of the Quashnet River in the cedar swamp a short distance to the east in order to encourage the migration of herring and improve the fishery. Unfortunately, the anticipated results did not materialize. In 1860, a shingle mill (later converted to a wool factory) and dam were built adjacent to the existing gristmill. The River was completely blocked with no fishways. Runs of migratory fish could no longer swim upstream. That barrier, coupled with the continuing overharvesting of herring and trout resulted in the virtual disappearance of salters upstream. From 1860 to 1894 much of the Quashnet Valley was a large mill pond backed up by the dam.

On the night of July 8, 1894, the mill and factory burned down. The mill pond was drawn down allowing the collected waters to flow freely, returning the River to its natural channel. But the resolution of one problem soon gave way to a new one, which was to alter the entire Quashnet Valley. Cranberry culture was expanding on Cape Cod and the newly exposed lands along the Quashnet River were tempting to growers who began

moving in as early as 1895. Soon the entire basin was transformed into cranberry bogs. Forests were cleared by stripping all growth for hundreds of feet on each side of the River. Tons of sand and gravel were poured into low swampy areas, leveling the terrain for easier planting and harvesting. The Quashnet River was converted into a conduit to service the bogs through control of the flow and volume of water as dictated by the growing season.

The dam at Johns Pond regulated the initial intake, and dikes, dams, and reservoirs along the route directed the water through small side ditches designed to flood or drain bogs as needed. The River itself was rechanneled and its natural meandering course was straightened out. Each winter the bogs were flooded to protect the plants and each summer tons of sand were added to keep unwanted vegetation from encroaching. These practices destroyed fish habitats from the cedar swamp to the Moonakis. Erosion and flooding silted up the stream and sand soon replaced the clean gravel. The increasing use of pesticides, herbicides, insecticides, and fertilizers took its toll as chemicals like rotenone and DDT contaminated both soil and water. Finally, the deforestation exposed the cool waters, preferred by the migrating fish, to the hot summer sun.

In August 1954, Hurricane Carol and subsequent flooding destroyed many of the bogs. Then in 1959, disaster hit the cranberry industry when residue from the herbicide aminotriazole was detected in a shipment of berries. The substance was registered for use on the bogs, but had been found to cause cancer in lab rats if taken in large doses. Although the polluted fruit was destroyed and no tainted berries reached the marketplace, the scare among consumers, fueled by a federal government press release, caused a precipitous drop in cranberry sales. Many bog owners decided reconstruction was not eco-

Cranberry bog. Photograph by Caroline Goldstein

nomically feasible. Bogs were abandoned and in some cases the land was sold.

The demise of the cranberry industry provided a respite for the River. There was an end to sanding and spraying. Dikes and ditches fell into disrepair, and dams opened up to the free flow of water. New growth, primarily leather leaf, blueberries, and small trees, took over the former bogs, providing shade to cool the stream at least in the southern portions.

Restocking and Restoration

The Massachusetts Division of Fisheries and Game, in conjunction with other agencies and expert consultants, carried out a survey of Massachusetts rivers from 1949 to 1954. The ensuing report recommended that the best interests of fishermen would be served by stocking the Quashnet River with hatchery brook trout. For about ten years annual stocking on a limited scale was carried out. The trout flourished and anglers were pleased as they made daily catches of several dozen "brookies" usually ranging from eight to twelve inches long. Because the hatchery brook trout did not migrate to the sea they did not grow as large as the earlier salters. Larger sea-going hatchery brown trout, a non-native species, had been successfully stocked in other coastal streams and the Division decided to try the same in the Quashnet. In 1971 the Division replaced brook trout with brown trout for stocking purposes.

Quashnet River, 1987
Photograph by Matt Patrick

In February of 1956, the Massachusetts Division of Fisheries and Game purchased a narrow corridor along each bank of the Quashnet River, extending from the site of the destroyed mill upstream about a mile and a quarter, an area of approximately twenty-six acres. In response to a growing interest in sea-going trout, the Division embarked on another five-year survey to document existing

conditions and make plans for improvements. Initial surveys showed that despite the short respite, the decades of sanding and maintaining the bogs were again taking their toll. The abandoned bogs and banks had deteriorated badly, becoming overgrown with bushes and trees, and clogging the channel to the point where it was almost unrecognizable. The current was slowed by choking tangles of brush and vegetation. Silt, debris, and organic matter created damming effects in many areas. The rising waters caused banks to collapse, depositing additional sand and silt. Water was forced out of the channel, overflowing the banks. The river became broad and shallow, spreading out to two or three times its normal width. This tangle of growth turned the Quashnet Valley into nearly four miles of impenetrable swamp land. With the exception of a few small spots where brush had been removed to allow access, the River was unapproachable; anglers could hardly find it, much less fish in it. One of the finest trout streams on the Cape had become an unfishable, unwadeable, brush-choked remnant of earlier times.

Quashnet River, 1987
Photograph by Matt Patrick

In the 1970s there were new concerns when a development company purchased vacated bogs just south of the cedar swamp with the intention of building a nine-hole golf course. Conservationists feared the potential impact of filling in low, wet areas and the use of pesticides, herbicides, and fertilizers. The Massachusetts Department of Natural Resources and the Conservation Commission of Mashpee carried out an extensive study, considering each proposed hole one by one. The protection of the River was of paramount importance. Specifications required that a 100-foot buffer zone along the main channel and its tributaries would remain in its natural state. There was to be no filling in low marshy lands except where expressly approved. Bridges were to be built on pilings to allow for the free flow of water, and cart paths were to be made of crushed stone. The use of chemicals was limited to those approved by state and local conservation agencies and had to meet certain criteria (i.e., biodegradable or capable of being absorbed into the soil within a few feet of application).

The course was opened for play in 1974 but was not an immediate financial success. The owner proposed to sell it to the Town of Mashpee in 1980. The offer was refused for economic, not ecological, reasons. The increasing popularity of golf changed the situation and in 1983 plans were drawn up to expand the course to 18 holes. The restrictions placed on the new construction were similar to those imposed in 1974 and the expansion was approved and completed.

Despite the rather degenerated condition of the Quashnet River, Joseph Bergin, an aquatic biologist with the Division of Fisheries and Game, believed the River had potential, particularly as a trout fishery. He sought support for a pilot project of restoration along the Division-owned banks. His plan was to remove barriers to migrating fish by clearing brush and debris from the channel. The faster current would wash sand and silt downstream where, at accessible locations, backhoes could remove most of the accumulation and the remaining residue would be carried into Waquoit Bay. Once the channel was clearly defined, brush cutting could be continued along the banks allowing easier access. Bergin believed the project would substantially increase the herring and alewife migrations to Johns Pond, providing important food supplies for the trout. In preparation, the Division made a survey of the land, dividing it into 8 sections with the lower 800 feet to be the first in which rehabilitation would take place.

Bergin enlisted the aid of the Cape Cod Chapter of Trout Unlimited, a non-profit organi-

L to R. A work session on the Quashnet in October 1987. Reggie Washburn, Brian Tucholke, Charles Trecoickas, Roy Hitchings, Joe Bergin, Bill Harrison, unidentified person, Fran Smith and son Brian. Photo by Matt Patrick.

Quashnet River, 1987, Photo by Matt Patrick.

zation dedicated to the restoration, preservation, and enhancement of cold water fisheries whose members believe that land and water management are essential both to the enjoyment of good fishing and to the protection of marine and terrestrial wildlife. Although Trout Unlimited had shown interest in a similar project in 1974, they had been unable to make much headway toward restoring the river. This time their efforts paid off. Restoration work on the river was started in May, 1976, under the leadership of Fran Smith, a local plumber and ardent angler. He became the driving force behind the project. Over the years he scheduled work parties, rounded up tools and materials, kept meticulous records, and handled public relations. The workers were volunteers who spent weekends and other spare time waging an environmental battle and making a meaningful contribution by preserving an important natural resource.

The first chore was to remove chunks of concrete walls that had collapsed ten years earlier at the Martin Road crossing. Workers with sledge hammers and crowbars cleared the channel and rebuilt the culvert with stone and timbers. They then began the task of cutting brush in the river and along the banks and stacking it in piles to provide habitat for small mammals and game birds. Next came the tedious job of clearing and opening the channel. Workers waded through the water removing rubbish, beer containers, old furniture, discarded appliances, tires, and other debris. They crawled through the river, opening clogged ditches which fed into the main stream. All work was done by hand because the soggy bogs could not support heavy equipment.

It required about six months to complete work on the designated 800-foot stretch. Meanwhile, what had started as brush cutting in a small area grew into a much more ambitious

plan—to restore the river in the state owned areas extending about a mile and a quarter upstream, including the trout spawning grounds. In July, the Division of Marine Fisheries installed a new fish ladder at the site of a small dam at the head of the property. The dam could be used to block the flow allowing work to be carried on in much shallower water downstream and build up a reservoir which, when released, would help scour the stream bed.

An additional boost was given to the project in February, 1977, when the local chapter of Trout Unlimited was selected as a participant in a national program called Operation Restore and received a grant to continue the work.

As work proceeded upstream more effective techniques were developed, allowing faster progress. Trees were planted to replace the overhead cover and shade that had been provided by the brush. The soggy banks were firmed up by the planting of a variety of grasses, particularly reed canary grass. Dams, which had been used by cranberry growers, were cleared as fishways. The insect population had declined considerably. Aquatic insects such as stoneflies, mayflies, damselflies and dragonflies were collected from the nearby Mashpee River and released in the renovated areas partly as an additional source of food for the expected increase in the fish population.

To facilitate the restoration, Smith and his volunteers constructed wing deflectors and bank overhangs along the course of the river. The deflectors consisted of V-shaped structures made of cedar logs and rocks attached to one of the banks. They narrowed and deepened the stream increasing the speed of the current. A ricocheting effect from bank to bank intensified the scouring action, allowing the river to clean itself by flushing sand and silt downstream into Waquoit Bay. The overhangs were designed for shade and protection from predators for young trout. They were made from cedar logs and submerged beneath the surface. Soil placed on top was planted with

Quashnet River, 1987, Photo by Matt Patrick.

vegetation making it almost impossible to distinguish the overhangs from natural banks. Eventually fourteen deflectors and twenty overhangs were installed.

The clearing of the lower river resulted in a more rapid flow, dropping the water level several inches upstream. To counter this a log barrier was built to slow the current. Reggie Washburn, a professional surveyor, made an aerial survey of the entire river from source to mouth enabling the projection of future changes resulting from the cutting of brush.

In 1979, the Massachusetts Division of Marine Fisheries installed a second fish ladder at the outlet at Johns Pond and stocked the pond with 3,000 herring. Because the river was more accessible, the annual runs increased dramatically, and spawning herring were often backed up at the fishways waiting to ascend.

The renovation took several years to complete. Spearheaded by a cadre of about thirty regulars, the work force was expanded by other volunteers from time to time. Thousands of work hours were logged in the process. The crew was made up of individuals who generally held full time jobs and who could have easily found more pleasurable ways to spend their leisure time than slogging through mud and brush in the Quashnet River. Bergin commented that it was remarkable that people returned year after year to perform boring, difficult, arduous labor, not because they enjoyed it but because they could envision a future for the river.

The result of the extensive effort revitalized the lower Quashnet as a prime fishing area. Species of wildlife flourished along the banks. Ruffed grouse, quail, herons, kingfishers, ducks, deer, and many other species of birds and animals have been spotted in the region. John J. Berger, in his article "Rebirth of a River" (Yankee Magazine, Oct., 1984) praised the success of the project as follows:

> The results of the Quashnet restoration are by now quite evident. Before repair began, the stream was straight, slow, and shallow—almost invisible in a tangle of brush. Now the stream has reemerged. It flows along gracefully curved lines. The banks are firmed and well defined. Shores are covered by three-foot-high canary grass. The channel is filled with swiftly flowing deep water, its surface dappled with undulating water starwort. The silt and organic debris have been washed off the bottom. The original pea-sized gravel is once again visible through the clear, cold flow.

In 1983 the Town of Mashpee purchased land north of the golf course for conserva-

tion purposes. From this purchase, Johns Pond Park was created, encompassing the cranberry bogs and swamps, the ditch connecting the Quashnet to its outlet, a 1200 foot sandy beach, and nearby Moody Pond. In addition to the swimming facilities, the Park contains about four miles of recreational trails and bog roads. In town meeting, Mashpee residents approved provisions to protect the land from further development. A one hundred foot buffer zone was created on each side of the river and the entire park was closed to all development except for the cranberry bogs which are leased out by the town.

To enhance protection of the lower basin, the Massachusetts Department of Environmental Management made offers to purchase about 400 acres along both sides of the Quashnet River between Route 151 and Martin Road. The parcels abutted the narrow strip along the immediate banks owned by the Division of Fisheries and Wildlife. This attractive property had also gained the attention of land developers who saw the site as prime territory for the construction of condominiums. Because of the rapid escalation of property values, the funds allocated by the Commonwealth were not sufficient and Foreward Development Corporation of Marstons Mills purchased some 340 acres. The Town of Mashpee responded negatively to the proposed construction largely because a section of the land incorporated an area believed to be one of the least contaminated prospective well sites on the Cape, deemed capable of providing a million gallons of drinking water per day.

Mashpee citizens adopted an "Open Space Incentive Development Plan" under which a compromise was reached. The developer would be allowed to construct 570 units in clustered housing on the high lands along the east bank overlooking, but not directly fronting, the river. In return, Mashpee would receive title to 270 acres on the west side as conservation land and to preserve potential well sites. The agreement did not completely satisfy conservationists who feared that any large-scale development could undermine all the painstaking work of rehabilitation. Because town meeting decisions can be reversed, conservationists were convinced that the only viable solution was state ownership. Representing a broad base of support, an ad hoc advocacy group called the Quashnet Coalition was organized to work with the Department of Environmental Management for the primary purpose of securing funds for the proposed purchase. The original estimated cost was ten million dollars even though the owners had an asking price of fourteen million.

The Coalition launched a publicity campaign to inform the public and muster additional support. They pointed out that evidence of pollution was becoming apparent. Shellfish beds along the Moonakis had been closed due to high coliform counts. There had been a sharp decline in bay scallop catches. Eelgrass, one of the few flowering salt water plants, was gradually disappearing. The source of these problems was nutrients in wastewater

from septic systems and surface runoff from lawns and roads. The excessive nutrients promoted the growth of algae which flourished, forming thick mats in the water, suffocating small fish and other marine growth. The adverse effects disrupted wildlife habitats and threatened recreational and aesthetic values. The Coalition pointed out that if the proposed condos were constructed, the increase in population within a few hundred feet of the river could destroy the fish and wildlife reserves through the leaching of nutrients and household chemicals. Informational materials distributed to the public stressed the need for preserving the entire ecological system.

> Clean groundwater makes the Quashnet work as a trout stream, and Waquoit Bay work as an estuary. Contaminate the Quashnet and you push Waquoit toward the brink. Clean up Waquoit Bay and you enhance the Quashnet. Protect the groundwater and save it all. And the way to protect ground water is to control what happens on the land, including the Quashnet watershed.

Many citizens who were not greatly concerned about fishing and hunting recognized the need for clean drinking water and joined forces with the Coalition by forming voter informational associations. Members of the Coalition agreed that if the land purchase could not be negotiated, the proposed compromise was a reasonable alternative, at least guaranteeing the preservation of prospective well sites.

In September, Mashpee Town Meeting responded to the campaign by imposing a two-year moratorium on all construction along the Quashnet. Although the restrictions could be lifted by another town meeting, the Coalition was given additional time to continue its efforts. Important support was forthcoming as the Waquoit Bay region was designated a National Estuarine Research Reserve, in recognition of its vital role as an estuarine ecosystem.

Taking up the cause of the Coalition, Massachusetts State Representative Thomas Cahir sponsored a bill (House #5014, the so-called Quashnet Bill) to appropriate ten million dollars for the proposed purchase. An intensive campaign was undertaken to convince other legislators to lend their support.

A public hearing was required before the bill could be presented to the House Ways and Means Committee. To emphasize the importance of the issue to Cape residents, legislators traveled to Mashpee where the hearing was held in Town Hall. They listened to proponents, including Fran Smith who made an impressive presentation. There was no testimony in opposition. Although it was acknowledged that ten million dollars might not be sufficient, it was hoped that it would provide a jump-start and attract additional funds

from governmental and private sources. In the interests of efficiency, the Quashnet Bill was attached to a Comprehensive Open Space Bond Bill supported by Governor Michael Dukakis, which provided 500 million dollars for land acquisition. The bill was signed into law late in 1987. Under the capital outlay program, governmental agencies and private conservationist organizations could request funds for purchases throughout the state.

In May, 1988, the Massachusetts Division of Fisheries and Wildlife bought three parcels of forest land south of Martin Road consisting of eleven acres of woodlands with river frontage of 2000 feet. Because the land abutted Route 28, it had been considered a prime site for residential development. In June, after negotiating with the Town of Mashpee, the lands owned by Foreward Development were purchased by the Massachusetts Department of Environmental Management and the Division of Fisheries and Wildlife.

In a letter dated July 1, 1987, Mashpee town planner Thomas Fudala recommended that a Quashnet River management program be developed to protect the entire system and that it be placed under the supervision of the newly organized Waquoit Bay National Estuarine Research Reserve (which is jointly managed and funded by the Department of Environmental Management and the National Oceanographic and Atmospheric Administration). The Reserve was designated as the protector of the Bay, its estuaries, and shores, and serves as a model site for scientific research on the ecosystem. The Reserve encompasses about 2,500 acres of open water, barrier beaches, marshlands, and uplands including part of the Quashnet River woodlands.

The Quashnet River was still managed primarily as a brown trout fishery. Beginning in 1985, annual surveys of the trout population were conducted by Trout Unlimited and the Division of Fisheries and Wildlife. In 1987, as a means of increasing the fish population, a section of the Quashnet River from Route 151 to the Moonakis was designated as a catch and release area: flies and lures were allowed but not live bait. Due to the improved habitat and the fishing restrictions, the sea-run brook trout population flourished and stocking of brown trout was suspended after the spring of 1994.

A draft Management/Maintenance plan for the newly acquired properties was prepared with the goal of conserving and protecting the water and habitats of the Quashnet River and Waquoit Bay. Recreational use of the natural resources that would not endanger animals, birds, fish, or their habitats would be encouraged . Trees would be cleared from the channel and concrete flumes and bog ditches would be removed. Low-impact leisure activities such as picnicking, canoeing, hiking, fishing, and hunting would be promoted. No motorized recreational vehicles would be allowed and efforts would be made to stop illegal dumping.

To enhance use of the area, plans were made to provide a parking lot on Martin Road

near the entrance, where a gate would be installed to keep out unauthorized vehicles. To encourage hiking, a loop trail was favored so that walkers could proceed up the west bank, cross over the fish ladder, and return down the east side to the parking area. The east trail was an overgrown logging road which required clearing to be easily traversed. In 1996 permits were granted by the Town of Mashpee and the trail project was completed.

In 1995 the Mashpee National Wildlife Refuge was designated. The Refuge is primarily within the Waquoit Bay watershed and includes much of the Quashnet River, including the state land mentioned above. In fact, there are several parcels within the boundary of the Refuge already managed as open space. The U.S. Fish and Wildlife Service and the eight state, local and private organizations who own the land have forged a management partnership. A Memorandum of Understanding provides a formal basis for cooperation among these groups to protect valuable wildlife habitat in the Refuge, including the Quashnet River.

In 1995, Mashpee purchased 135 acres along the west side of the Quashnet just south of Route 151 and adjacent to state-owned land, as the site for a new high school. Anticipating potential problems, the Waquoit Bay National Estuarine Research Reserve and others offered suggestions related to the treatment and disposal of waste materials, soil erosion, storm water run-off, and protective buffer zones. In response, the Town of Mashpee provided a wide buffer of vegetated land between the River and the school's structures and activities. A Conservation easement on this buffer was donated to the Mashpee National Wildlife Refuge.

Despite all the measures to protect open space, the problems besetting the Quashnet River have not been solved. Seepage from cranberry bogs and golf courses are augmented by nutrients from human waste and household chemicals. Accidents and unforeseen conditions will continue to arise.

Perhaps the most disturbing problem came to light in 1996, when the cranberry crop grown in the headwater bogs was rendered inedible by pollution and the entire harvest had to be incinerated. The source of the pollutants is believed to be an upwelling within the bogs and swamps themselves and is not thought to be coming from Johns Pond. The water contains ethylene dibromide, a component of aviation fuel, which was carried into the groundwater from spills at the Massachusetts Military Reservation. The Air Force assumed responsibility for the lost cranberry crop and made reparations to the owners. In an effort to define the extent of the problem and propose solutions, the Air Force Center for Environmental Excellence announced that a number of monitoring wells, some extending to a depth of 200 feet, will be installed to test groundwater in Mashpee. Other test sites will be drilled in the northern sections of Johns Pond. The Air Force proposed a project by which the River would be separated from the affected bogs.

The Quashnet River is a small stream and relatively insignificant to the global ecosystem, but its history provides an example of the resilience of natural resources. For over a century, human activities have impacted the health of the river. With the aid of dedicated conservationists, it has been at least partially restored to its original state. Most of the negative impacts affected the rivers physical aspects. With concerted effort, dams can be removed, and ditches protect the banks. Impacts from the Massachusetts Military Reservation, nutrient enrichment from septic systems, atmospheric deposition and fertilizers may be more difficult to resolve. The Towns of Falmouth and Mashpee and concerned local citizens would be well served to develop a coordinated management plan to prevent or forestall any human activities which might cause further problems for the Quashnet River.

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Waquoit Bay National Estuarine Research Reserve files.

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